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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/813,365

03/30/2004

James Edward Simpson

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10/05/2005

EXAMINER

SONG, HOON K

Patrick S. Yoder
FLETCHER YODER

P.O. Box 692289

Houston, TX 77269-2289

ART UNIT

PAPER NUMBER

2882

DATE MAILED: 10/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary	Application No. 10/813,365	Applicant(s) SIMPSON ET AL.	
	Examiner Hoon Song	Art Unit 2882	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 July 2005.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-8,10-17 and 19-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-8,10-17 and 19-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-2, 4-8 and 10-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carlson et al. (US 5978447) in view of Chidester and Carlson et al. (US 4577340).

Regarding claims 1, 7 and 14, Carson ('447) teaches a CT system, comprising:
a gantry (16) adapted to rotate about a volume;
an X-ray tube (12) mounted on the gantry, the X-ray tube, comprising:
an anode assembly (figure 2), comprising:
a target for emitting X-rays upon irradiation with an electron beam (62),
a rotor shaft (75, 70) coupled to a motor rotor system (80) and the target, the rotor shaft (75, 70) configured to rotate the target (55), and
a bearing system (78) comprising at least two bearings (90a, 90b) supporting the rotor shaft (figure 1); and
a cathode (20) assembly, comprising:
a cathode (20) configured to emit the electron beam,
an X-ray detecting unit configured to detect the X-rays emitted from the X-ray

tube and transmitted through the volume and to generate a detector output signal in response to the detected X-rays; an X-ray controller configured to operate the X-ray tube; a data acquisition system for receiving the detector output signal; an image reconstructor coupled to the data acquisition system for generating

an image signal in response to the detector output signal; and a computer for controlling the operation of at least one of the X-ray controller, the data acquisition system and the image reconstructor.

But Carlson ('477) fails to teach the cathode has an insulator isolating the cathode from ground potential (figure 1).

Chidester teaches an x-ray cathode insulator (40 or 70).

It would have been obvious to one of ordinary skill in the art at the time of the invention to adapt the x-ray tube of Carlson with the cathode insulator as taught by Chidester, since the insulator would reduce in voltage from the high voltage present at the anode and/or cathode to the much lower housing or ground potential (column 2 line 25-27).

Furthermore, Carlson ('477) fails to teach the bearings are duplex bearings.

Carlson ('340) teaches an x-ray target shaft support bearing system having at least two duplex bearings (78, figure 1).

It would have been obvious to one of ordinary skill in the art at the time of the invention to adapt the bearings of Carlson ('477) with the duplex bearing as taught by Carlson ('340), since duplex bearing would improve durability (column 4 line 58).

Regarding claim 2, Chidester teaches the insulator comprises a conical insulator (40).

Regarding claim 4, Carlson as modified by Chidester teaches the insulator is offset in a radial direction to the motor rotor system (figure 2).

Regarding claim 5, Carlson ('340) teaches the at least two duplex bearing assemblies distribute load substantially evenly (figure 1).

Regarding claims 6, 13 and 18, Carlson ('477) teaches the at least two bearing assemblies straddle the target (figure 2).

Regarding claim 8, Chidester teaches the insulator comprises a conical insulator (40).

Regarding claim 10, Carlson ('477) teaches the insulator is offset in a radial direction to the motor rotor system (figure 2).

Regarding claim 11, Carlson ('477) teaches a collimator (18) to direct the beam to the subject.

Regarding claim 12, Carlson ('477) teaches the at least two bearing assemblies distribute load substantially evenly (figure 2).

Regarding claim 15, Carlson teaches a fixed stem (50).

Regarding claim 16, Carlson teaches the rotor shaft (44) is coupled with the fixed stem (50) via the at least two duplex bearing assemblies (78).

Regarding claim 17, Carlson teaches the at least two duplex bearing assemblies allows load to be distributed substantially evenly (figure 1).

Claims 14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carlson et al. (US 4577340) in view of Carlson et al. (US 5978447).

a target (43) for emitting X-rays upon irradiation with an electron beam (20);
a rotor shaft (44) coupled to a motor rotor system (100) and the target (43), the rotor shaft (44) configured to rotate the target (43); and
a bearing system (78, figure 1) comprising at least two duplex bearing assemblies supporting the rotor shaft (figure 1).

However Carlson ('340) fails to teach the at least two duplex bearing assemblies straddle the target.

Carlson ('447) teaches an x-ray tube straddle bearing assembly (figure 2).

It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the x-ray tube configuration of Carlson ('340) with the x-ray tube configuration with the straddle bearing assembly as taught by Carlson ('447), since the x-ray tub configuration of Carlson ('447) would more equally distribute the load of the rotating assembly among the bearings so that it would reduce the bearing failure.

Regarding claim 15, Carlson teaches a fixed stem (50).

Regarding claim 16, Carlson teaches the rotor shaft (44) is coupled with the fixed stem (50) via the at least two duplex bearing assemblies (78).

Regarding claim 17, Carlson teaches the at least two duplex bearing assemblies allows load to be distributed substantially evenly (figure 1).

Claims 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over McCarthy, JR. (US2004/0109538A1).

Regarding claims 19-20, McCarthy teaches a method for CT imaging, the method comprising:

rotating a gantry (12) about a subject (20) at three rotations per second (paragraph 0027, line 8-10);
emitting X-rays from an X-ray tube (18) mounted on the gantry (12); and
generating one or more images of the subject based upon the attenuation of the emitted X-rays by the subject (CT imaging, figure 1).

McCarthy fails to teach a method of rotating the gantry comprises rotating the gantry at greater than three rotation or at approximately five rotations per second.

However it would have been obvious to one of ordinary skill in the art at the time of the invention to rotate the gantry of McCarthy at greater than three rotation at approximately five rotations per seconds, since the faster rotational speed of the gantry would reduce scanning time.

Regarding claim 21, McCarthy teaches a CT system, comprising:
means for rotating a gantry (12) about a subject (20) at three rotations per second or faster (paragraph 0027, line 8-10);
means for emitting X-rays from an X-ray tube (18) mounted on the gantry; and
means for generating one or more images of the subject based upon the attenuation of the emitted X-rays by the subject (CT imaging, figure 1).

Response to Arguments

Applicant's arguments filed 7/22/2005 have been fully considered but they are not persuasive.

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. In this case one having ordinary skill in the art would have the knowledge of a duplex bearing is durable than a single bearing and the knowledge is not gleaned only from the applicant's discloser, the one having ordinary skill in the would be motivated to adapt the single bearing system of Carson ("447) with the dual bearing system of Carlons ('340) in order to improve the durability.

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning for rotating a gantry at greater than three or at about five revolution per second, one having ordinary skill in the art would have the knowledge that faster rotation of the gantry will generate faster data acquisition so that scanning time would be reduced and the knowledge is not gleaned only from the applicant's discloser, the one having ordinary skill in the would be motivated to rotate the gantry at greater than three or at about five revolution per second in order to reduce the scanning time. Furthermore, the applicant's argues that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., physical constraints on gantry rotational velocity at three or more revolution per second) are not recited in the rejected claim(s). Although the claims are

interpreted in light of the specification, limitations from the specification are not read into the claims. In this case since McCarty discloses the every claim limitations as claimed in claim 19-21 without any physical constraints of prohibit gantry speed of the claimed speed. Accordingly, one having ordinary skill in the art would be motivated to rotate McCarty's gantry at claimed rotational speed in order to achieve faster scanning speed.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hoon Song whose telephone number is (571) 272-2494. The examiner can normally be reached on 8:30 AM - 5 PM, Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Glick can be reached on (571) 272 - 2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2882

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

HKS

10/11/05
HKS



DAVID V. BRUCE
PRIMARY EXAMINER